

# Performance of Steers Fed Soybean Meal or Soybean/Soybean Hull Supplements While Grazing on Rangeland in the Late Summer

F. T. McCollum<sup>1</sup>

## Story in Brief

Preliminary results from two late-summer supplementation trials are presented. Responses varied between research sites. At Pawhuska, performance of steers grazing on deferred rangeland was improved by protein supplementation. But, provision of energy as soybean hulls in addition to the soybean meal supplement had no apparent effect on gain. Unsupplemented steers at Stillwater gained at a faster rate than their unfed counterparts at Pawhuska. Magnitude of response to the supplements varied between groups of cattle at Stillwater and was possibly influenced by age and management history of the cattle.

## Introduction

Previous research has demonstrated that late-summer gains of stocker cattle grazing on rangelands in central and eastern Oklahoma can be improved by feeding a small amount of a high natural protein supplement (Lusby, 1985). Recently, high fiber, high energy feeds such as corn gluten feed and soybean hulls, have been suggested as a means of providing supplemental energy to grazing cattle while avoiding the associative effects sometimes attributed to starchy, grain supplements (Fleck et al., 1986; Hibberd et al., 1986).

These trials were conducted to compare the performance of beef steers supplemented with a high protein oilseed meal or a medium protein feed containing a high fiber energy source.

## Materials and Methods

Two supplemental feeding trials were conducted in the summer of 1986. Supplements were milled at OSU Feed Mill and transported to the Pawhuska Research Station in northcentral Oklahoma and the Animal Science Range Research area 8 miles southwest of Stillwater. Both areas are situated on the western edge of the Cross Timbers resource area; primary forage grasses are big bluestem and little bluestem while switchgrass and indiangrass are present in varying amounts.

Composition of the supplements is presented in table 1. Steers were fed 6.3 lb/hd/wk (dry matter basis) of the soybean meal (SBM) supplement. Previous studies have shown this to be the most efficient level of supplemental protein for stockers grazing native range in the late-summer (Lusby, 1985). The soybean meal/soybean hull (SBM/SBH) mixture was fed at a rate of 14.9 lb/hd/wk (dry matter basis). This rate was established to provide a daily feeding of soybean meal similar to the SBM treatment with an additional increment of feed formulated to provide an estimated .90 lb of TDN and .18 lb of crude protein per head

<sup>1</sup>-----  
Assistant Professor, Animal Science Dept.

Table 1. Composition of supplements.

	SBM	SBM/SBH
	-----% As fed-----	
Soybean meal	96.0	50.5
Soybean hulls	--	48.0
Cane molasses	4.0	--
Limestone	--	1.5
	-----% dry matter-----	
Crude protein	42.7	29.5
TDN <sup>1</sup>	84.0	75.0

<sup>1</sup> Estimated assuming that soybean hulls contained 68% TDN and soybean meal contained 84% TDN.

daily. It was assumed that soybean hulls contained 68% TDN and 13% CP. Prorated amounts of the supplements were fed on Monday, Wednesday and Friday during the trials. A free-choice mineral supplement was available to the cattle at all times.

Both trials started July 18, 1986. The Pawhuska trial ended on September 29 while the Stillwater trial was terminated on October 7. All cattle were weighed after a overnight shrink.

In the Pawhuska trial, 60 crossbred beef steers were divided into three treatment groups. The treatment groups were maintained on separate pastures that had been deferred from grazing since late April. Cattle were rotated among pastures every 10 days. Supplements were group-fed in troughs.

Sixty head of steers were also utilized in the Stillwater trial. These cattle were initially divided into two groups of 30 head based on management history. Group 1 steers were approximately 17 months of age in the spring of 1986 and had been wintered at no gain from November to April. Group 2 was selected from a set of steers purchased in February and March, conditioned and subsequently delivered to OSU. Based on appearance, the cattle were younger than Group 1. Early summer weight gains averaged 243 and 192 lb/hd, respectively, for Group 1 and Group 2. Cattle within each group were randomly assigned to the three treatments. All cattle were maintained on a common pasture that had been grazed since late April. The steers were gathered on feeding days, sorted into treatment groups, and group-fed their respective supplements.

### Results and Discussion

Data from the trials are presented in tables 2 and 3. The results are preliminary and have not been analyzed statistically. Hence, definite conclusions cannot be made until further trials are completed.

Response to supplements varied between research sites and groups of cattle. Differences in gains of nonsupplemented groups at the two research sites possibly reflects pasture conditions. Previous research in Kansas demonstrated that late season weight gains were significantly lower on deferred pastures compared to gains on continuously grazed pastures (Launchbaugh and Owensby, 1978).

On deferred pastures, performance should not be limited by forage availability but instead by nutrient availability. The Pawhuska data

Table 2. Weights and gains of steers at Pawhuska.

	Control	SBM	SBM/SBH
Days on trial	74	74	74
Initial wt., lb	657	657	665
Final wt., lb	717	754	765
Total gain, lb/hd	60	97	100
Daily gain, lb/hd	.81	1.31	1.35
Supplement efficiency, lb suppl. DM /lb added gain --		1.8	3.9

Table 3. Weights and gains of steers at Stillwater.

	Control	SBM	SBM/SBH
Days on trial	81	81	81
Group 1			
Initial weight, lb	780	778	784
Final weight, lb	898	920	942
Total gain, lb/hd	118	142	158
Daily gain, lb/hd	1.46	1.75	1.95
Supplement efficiency, lb suppl. DM /lb added gain	--	3.1	4.3
Group 2			
Initial weight, lb	708	712	700
Final weight, lb	808	821	817
Total gain, lb/hd	100	109	117
Daily gain, lb/hd	1.23	1.35	1.44
Supplement efficiency, lb suppl. DM/lb added gain	--	7.5	10.1

suggests that protein intake was limiting since there was no apparent response to additional TDN in the SBM/SBH supplement. If one subtracts the gain due to SBM from the SBM/SBH response, estimated conversion efficiency for the additional supplement was 30:1.

Response to supplements at Stillwater appeared to vary among groups of cattle. Gains of cattle in Group 1 were higher for all treatments compared to steers in Group 2. Supplement intake required to produce an extra pound of gain was approximately 58% lower for steers group 1 compared to group 2. Since the cattle were grazing on the same pasture, the varied responses must be related to differences in the cattle. Steers in group 1 had noticeably larger frame size than the remaining group. The combination of age and frame may have contributed to efficiency and level of gain of group 1 compared to group 2. Although larger, more mature animals have higher absolute daily nutrient requirements, maintenance requirements relative to intake capacity are lower compared to younger, smaller framed animals.

Due to the variation among locations and groups of cattle, no definite conclusions can be drawn from the data.

### Literature Cited

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